

Work Order # _____ Job # _____ Activity # _____

1. Work requester fills out this section

STANDING WORK PERMIT ☐

Requester: P. KROON Date: 6/7/04 Ext. 5114 Dept/Div/Group: PO / PHENIX
Other Contact person (if different from requester): SAL MARINO Ext. 3704
Work Control Coordinator P. KROON Start Date 6/8/04 Est. End Date 6/22/04
Description of Work / Problem: REPAIR FEM MODULE INSIDE SOUTH MOON MAGNET.

Building 1008 Room IR Equipment N/A Service Provider PHENIX

2. Work requester, service provider, and ES&H (as necessary) fill out this section or attach analysis

ES&H Analysis

RADIATION CONCERNS ☒ NONE ☐ Activation ☐ Airborne ☐ Contamination ☐ Radiation ☐ OTHER _____
☐ Special nuclear materials involved, notify Isotope Special Materials Group ☐ Fissionable materials involved, notify Laboratory Criticality Officer

SAFETY CONCERNS ☐ NONE
☐ Adding / Removing Walls or Roofs ☒ Confined Space* ☐ Explosives ☐ Lead* ☐ Penetrating Fire Wall
☐ Asbestos* ☐ Corrosive ☐ Flammable ☐ Magnetic Field ☐ Pressurized Systems
☐ Beryllium* ☐ Cryogenic ☐ Fumes/Mist/Dust* ☐ Material Handling ☐ Rigging/Critical Lift
☐ Biohazard* ☐ Electrical ☐ Heat/Cold Stress* ☐ Noise* ☐ Toxic Materials*
☐ Chemicals* ☐ Elevated Work* ☐ Hydraulic ☐ Non-ionizing Radiation ☐ Vacuum
☐ Excavation ☐ Lasers* ☐ Oxygen Deficiency* ☐ OTHER _____

*Does this work require medical clearance or surveillance from the Occupational Medicine Clinic? ☐ Yes ☒ No

ENVIRONMENTAL CONCERNS ☒ NONE ☐ Work impacts Environmental Permit No. _____
☐ Atmospheric Discharges (rad/non-rad) ☐ Liquid Discharges ☐ Soil activation/contamination ☐ Waste - Mixed
☐ Chemical or Rad Material Storage or Use ☐ Oil / PCB Management ☐ Waste - Clean ☐ Waste - Radioactive
☐ Cesspools (UIC) ☐ Protected areas / species ☐ Waste - Hazardous ☐ Waste - Regulated Medical
☐ High water / power consumption ☐ Spill potential ☐ Waste - Industrial ☐ OTHER _____

Waste disposition by: _____

POLLUTION PREVENTION (P2) / WASTE MINIMIZATION OPPORTUNITY: ☒ None ☐ Yes

Facility Concerns

☒ NONE

☐ Access/Egress Limitations ☐ Impacts Facility Use Agreement ☐ Temperature Change ☐ OTHER _____
☐ Configuration Control ☐ Maintenance Work on Ventilation Systems ☐ Utility Interruptions
☐ Electrical Noise ☐ Potential to Cause a False Alarm ☐ Vibrations

Work Controls

WORK PRACTICES ☐ NONE ☐ Exhaust Ventilation ☒ Lockout/Tagout MAGNET ☐ Spill Containment
☒ Back-up Person/Watch ☐ HP Coverage ☐ Posting/Warning Signs ☐ Time Limitation
☐ Barricades ☐ IH Survey ☐ Scaffolding - requires inspection ☐ Warning alarm (i.e. "high level")

PROTECTIVE EQUIPMENT ☒ NONE ☐ Ear Plugs ☐ Gloves ☐ Lab Coat ☐ Safety Glasses
☐ Coveralls ☐ Ear Muffs ☐ Goggles ☐ Respirator ☐ Safety Harness
☐ Disposable Clothing ☐ Face Shield ☐ Hard Hat ☐ Shoe covers ☐ Safety Shoes ☐ OTHER _____

PERMITS REQUIRED Initial next to box to show who has responsibility to generate the permit. Permits must be valid when job is scheduled.

(Please attach) ☒ NONE ☐ Cutting/Welding ☐ Impair Fire Protection Systems
☐ Concrete/Masonry Penetration ☐ Digging/Core Drilling ☐ Rad Work Permit - RWP No. _____
☒ Confined Space Entry ☐ Electrical Working Hot ☐ OTHER _____

DOSIMETRY/ MONITORING ☒ NONE ☐ Heat Stress Monitor ☐ Real Time Monitor ☐ TLD
☐ Air Effluent ☐ Noise Survey/Dosimeter ☐ Self-reading Pencil Dosimeter ☐ Waste Characterization
☐ Ground Water ☐ O₂/Combustible Gas ☐ Self-reading Digital Dosimeter ☐ OTHER _____
☐ Liquid Effluent ☐ Passive Vapor Monitor ☐ Sorbent Tube/Filter Pump

Training Requirements (List below any location specific training requirements)

CONFINED SPACE

*Based on analysis above, the Walkdown Team determines the risk, complexity, and coordination ratings below.

ES&H Risk Level: LOW ☒ MODERATE HIGH
Complexity Level: LOW ☒ MODERATE HIGH
Work Coordination: LOW ☒ MODERATE HIGH

Note: If all the ratings are LOW, the Work Control Coordinator and Service Provider must sign for concurrence on the back side. Further review of the work permit is not required. If any ratings are MODERATE or HIGH, the entire permit must be completed.

3. Both work requester and service provider coordinate on work plan (use attachments for detailed plans)

Work Plan: (procedures, timing, equipment, and personnel availability need to be addressed) _____

SEE ATTACHED

Special Working Conditions Required: _____

Operational Limits Imposed: None

Post Work Testing Required: No

Job Safety Analysis Required Yes ☒ No

Walkdown Required ☒ Yes No

Reviewed By: Primary Reviewer will determine the size of the review team and the other signatures required based on hazards and job complexity. Primary Reviewer signature means that the hazards and risks that could impact ES&H have been identified and will be controlled according to BNL requirements.

Title	Name (print)	Signature	Life #	Date
Primary Reviewer	Ashley J. Koon	<i>Ashley J. Koon</i>	18661	6/8/04
ES&H Professional	Asher Etlin	<i>Asher Etlin</i>	13163	6-8-2004
Other	PEANSON	<i>PEANSON</i>	15245	6/8/2004
Other				
Work Control Coordinator*	P. KROON	<i>P. KROON</i>	17500	6/8/04
Service Provider*				

*Only signatures required for concurrence on LOW rated jobs.

Review done: in series team

4. Job site personnel fills out this section

Note: Signature indicates personnel performing work have read and understand the hazards and permit requirements (including attached permits).

Job Site Supervisor	<i>[Signature]</i>	Contractor Supervisor	
Workers:	<i>[Signature]</i>	Workers:	<i>[Signature]</i>
	Life # <u>U8234</u>		Life # _____

Workers are encouraged to provide feedback on ES&H concerns or on ideas for improved job work flow. Use feedback form or space below.

5. Work Requester or designee fills out this section

Conditions are Appropriate to Start Work: (Work permit has been reviewed, work controls are in place, and site is ready for job.)

Name P. KROON Signature *[Signature]* Life # 17500 Date 6/14/04

6. Work Requester determines if Post Job Review is required ☒ No Yes (Fill in names of reviewers)

Post Job Review:

Name: _____	Signature _____	Life #: _____	Date: _____
Name: _____	Signature _____	Life #: _____	Date: _____

7. Worker provides feedback

Worker Feedback: _____

8. Work Control Coordinator (requesting dept.) checks quality of completed permit and closes out

Closeout: Name PETER J. KROON Signature *[Signature]* Life #: 17500 Date: 6/14/04

Comments: All work inside MARS completed in one entry - operation for ~1 week confirmed success.

Repair FEM inside South Muon Magnet in PHENIX IR, Bldg. 1008.

Confined space entry - Class 2A: Enter the South Muon Magnet (MMS) in the PHENIX experimental hall at RHIC (bldg. 1008), and repair electronics module (FEM card). The detector chambers inside the MMS contain an inert gas (argon). Hazardous Atmosphere Testing is not required. The hazards are that entry is via ladder through an opening created by removal of the east vertical lampshade, about 11 feet above track level, and the magnet has a sloping floor (35 to 45 deg. From vertical) presenting the danger of a fall (about 6 feet elevation change down sloping floor). These are mitigated by installing "steps" on the sloping floor, and adherence to the "two person" rule. When the magnet is occupied, two people must be present and within talking distance at all times.

This work is to be done by fully trained and experienced PHENIX personnel, under the supervision of Sal Marino. A properly executed and signed Confined Space Entry (CSE) Certification is required prior to entry.

Procedure

LOTO the power to the magnet coil at the power supply in 1008B. (Pearson)

Verify that only argon gas is flowing to the chambers. (Biggs)

Secure a ladder to the east side of the MMS. (Marino)

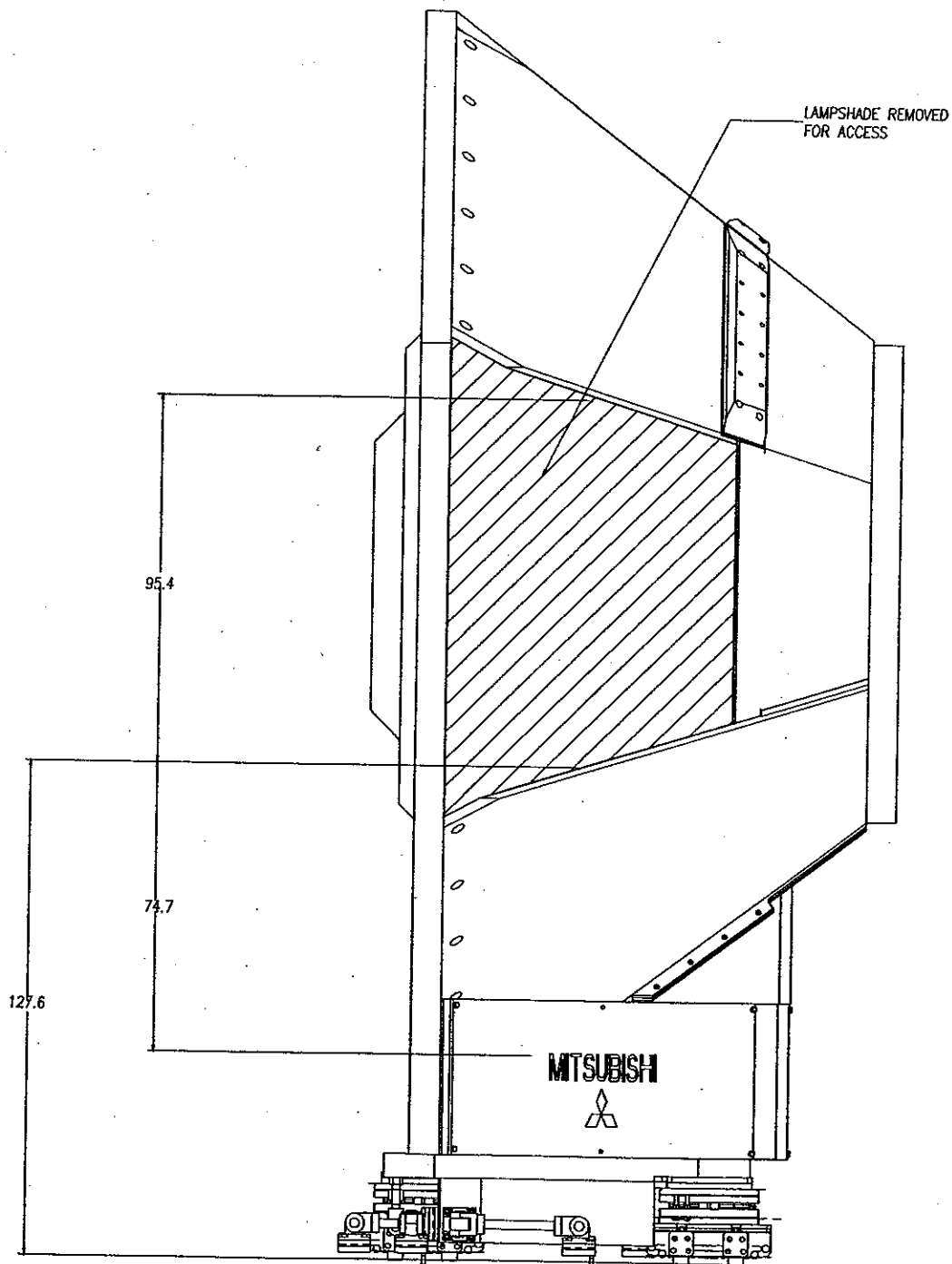
Enter the magnet and install the pre-fabricated steps on the lower east lampshade panel, working from the bottom up. If access is required to any west-side electronics, the steps up the sloping west side will also be installed. Work is limited to the bottom three sectors of stations two and three and the lower crates of the vertical sectors that may be easily reached from the steps. (Marino, MuTr experts)

Enter the magnet and remove/repair/replace FEM components. If one person enters then a second will provide back-up at the entry hatch. (MuTr experts)

Once work is complete, remove the internal steps, sweep the magnet interior for tools and personnel and remove the external access ladder. (Marino, MuTr experts)

Remove LOTO on magnet power supply. (Pearson)

CP 6/11/2004
FES Tag # 65492
Arturo Biggs 6/19/04



C-A CONFINED SPACE ENTRY CERTIFICATION

Location <u>PHENIX SOUTH MOON MAGNET</u>		Date <u>6/14/04</u>
Building <u>1008</u>	Area/Location/Room: <u>IR</u>	
Supervisor/Designee <u>SAL MARINO</u>		Classification from C-A Inventory List: <u>N/A</u>
		Life # <u>15767</u>

PRE-ENTRY QUESTIONS

For each item, check "yes" or "no": If no, consult Supervisor

	N/A	YES
Is entry essential to perform work?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Have all employees been trained in confined space entry?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are conditions safe to remove utility-hole cover?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Has opening been guarded?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is monitoring equipment calibrated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Has monitoring been performed and recorded below?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is GFCI used, if outside or in wet conditions?	<input type="checkbox"/>	<input type="checkbox"/>
Is ventilation blown into bottom of space? (If required)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Are employees instructed to evacuate upon hazard detection?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Have all workers reviewed these entry requirements?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Radiation: If present, RWP may be required – review work with ESH Coordinator and/or RCD personnel. Evaluate hazards and controls.	<input checked="" type="checkbox"/>	<input type="checkbox"/>

☐ Reviewed

SPACE CLASSIFICATION QUESTIONS

For each item, check box only if "yes"

	Class 2A	Class 2B	Class 2C
Engulfment Hazard Present	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Entrapment Hazard Present	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electrical Systems:			
• Deenergized	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Energized and Working Hot	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Energized, but Guarded or not Working Hot	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mechanical Systems:			
• Deenergized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Energized and Working Hot	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Energized but Guarded or not Working Hot	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other Energized Systems: (e.g. steam, sewage)			
• Deenergized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Energized and Working Hot	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Energized but Guarded or not Working Hot	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chemical Hazards inherent in space, based upon monitoring, but Controllable by ventilating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chemical Hazards inherent in space, based upon monitoring, but not controllable by ventilating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chemical Sources, introduced into space? (e.g. welding fumes, solvents)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
High Temperature/Pressure Hazard? (other than steam utility-holes)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- If ANY box in column 2C is checked, a Confined Space Permit IS required.
- If any box in column 2B is checked, and none in column 2C, a Confined Space Permit IS NOT required BUT continuous monitoring and ventilating ARE required.
- If only boxes in column 2A are checked, no additional requirements apply.

Classification evaluation

CLASSIFICATION	I have completed the front and back of this Confined Space Entry Certification form and classified this space. If the confined space is classified as a 2C, I will obtain a Confined Space entry permit from the ESH Coordinator. If the space is Class 2B, continuous monitoring and ventilation is required and will be documented on this form.		
CLASS: <u>2A</u>	Supervisor/Designee: <u>SAL MARINO</u>	Life # <u>15767</u>	Date: <u>6/14/04</u>

C-A CONFINED SPACE ENTRY CERTIFICATION

Meter:	Serial #	Calibration Date:
Day of Use Sensor Check <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
Tested By:	BNL#:	

MONITORING RESULTS

Tested By:		BNL Number:			
Date/ Time	Oxygen % (% O2)	Flammable Gas (% LEL)	Carbon Monoxide (CO ppm)	Hydrogen Sulfide (H2S ppm)	Other:
Pre-Entry Certification test		N/A	N/A		
Acceptable Reading	19.5 – 23.5 %	< 10 % of LEL	< 25 ppm	< 10 ppm	

Supplemental sampling record

CLASS 2B CONFINED SPACE ENTRY CERTIFICATION

For Class2B spaces, Hourly or Periodic monitoring is required.

MONITORING RESULTS

Tested By:		BNL Number:			
Date/ Time	Oxygen % (% O2)	Flammable Gas (% LEL)	Carbon Monoxide (CO ppm)	Hydrogen Sulfide (H2S ppm)	Other:
Acceptable Reading	19.5 – 23.5 %	< 10 % of LEL	< 25 ppm	< 10 ppm	

Class 2B: Describe Method of Ventilation:

Muon Magnet Confined Space Entry certification Sheet.

The undersigned certify that they have taken the BNL Confined Space Training within the last twelve months, and understand the hazards involved in working inside the south and north muon magnets (MMS and MMN).

[illegible]